

**DEPARTMENT OF CONSUMER AND INDUSTRY SERVICES**  
**DIRECTOR'S OFFICE**  
**GENERAL INDUSTRY SAFETY STANDARDS**

These rules take effect January 1, 1975

(The director of the department of consumer and industry services determines that the following federal standard was incorporated by reference by Section 14(1) of Act No. 154 of the Public Acts of 1974, and is to be administered and enforced by the department of consumer and industry services)

Bureau of Safety and Regulation, Standards Division Web-Site: [www.cis.state.mi.us/bsr/divisions/std](http://www.cis.state.mi.us/bsr/divisions/std)

**PART 94. TEXTILES (1910.262)**

**(a) Application requirements.**

**(1) Application.** The requirements of this standard for textile safety apply to the design, installation, processes, operation and maintenance of textile machinery, equipment, and other plant facilities in all plants engaged in the manufacture and processing of textiles, except those processes used exclusively in the manufacture of synthetic fibers.

**(2) Standards incorporated by reference.** Standards covering issues of occupational safety and health which are of general application without regard to any specific industry are incorporated by reference in paragraphs of this section and made applicable to textiles.

**(b) Definitions applicable to this section.**

**(1) Belt Shifter.** A "belt shifter" is a device for mechanically shifting a belt from one pulley to another.

**(2) Belt shifter lock.** A "belt shifter lock" is a device for positively locking the belt shifter in position while the machine is stopped and the belt is idling on the loose pulleys.

**(3) Calender.** A "calender" in essence consists of a set of heavy rollers mounted on vertical side frames and arranged to pass cloth between them. Calenders may have two to ten rollers, or bowls, some of which can be heated.

**(4) Embossing calender.** An "embossing calender" is a calender with two or more rolls, one of which is engraved for producing figured effects of various kinds on a fabric.

**(5) Cans (drying).** Drying "cans" are hollow cylindrical drums mounted in a frame so they can rotate. They are heated with steam and are used to dry fabrics or yarn as it passes around the perimeter of the can.

**(6) Carbonizing.** "Carbonizing" means the removing of vegetable matter such as burns, straws, etc., from wool by treatment with acid, followed by heat. The undesired matter is reduced to a carbon-like form which may be removed by dusting or shaking.

**(7) Card.** A "card" machine consists of cylinders of various sizes – and in certain cases flats – covered with card clothing and set in relation to each other so that fibers in staple form may be separated into individual relationship. The speed of the cylinders and their direction of rotation varies. The finished product is delivered as a sliver. Cards of different types are: The revolving flat card, the roller-and-clearer card, etc.

**(8) Card clothing.** "Card clothing" is the material with which many of the surfaces of a card are covered; e.g., the cylinder, doffer, etc. It consists of a thick foundation material, usually made of textile fabrics, through which are pressed many fine, closely spaced, specially bent wires.

**(9) Comber.** A "comber" is a machine for combing fibers of cotton, wool, etc. The essential parts are a device for feeding forward a fringe of fibers at regular intervals and an arrangement of combs or pins which, at the right time, pass through the fringe. All tangled fibers, short fibers, and nips are removed and the long fibers are laid parallel.

**(10) Combing machinery.** "Combing machinery" is a general classification, including combers, sliver lap machines, ribbon lap machines, and gill boxes, but excluding cards.

**(11) Cutter (rotary staple).** A rotary staple "cutter" is a machine consisting of one or more rotary blades used for the purpose of cutting textile fibers into staple lengths.

**(12) Exposed to contact.** "Exposed to contact" shall mean that the location of an object, material, nip point, or point of operation is such that a person is liable to come in contact with it in this normal course of employment.

**(13) Garnett machine.** A "Garnett machine" means any of a number of types of machines for opening hard twisted waste of wool, cotton, silk, etc. Essentially, such machines consist of a lickerin; one or more cylinders, each having a complement worker and stripper rolls; and a fancy roll and doffer. The action of such machines is somewhat like that of a wool card, but it is much more severe in that the various rolls are covered with garnett wire instead of card clothing.

**(14) Gill box.** A “gill box” is a machine used in the worsted system of manufacturing yarns. Its function is to arrange the fibers in parallel order. Essentially, it consists of a pair of feed rolls and a series of followers where the followers move at a faster surface speed and perform a combing action.

**(15) Interlock.** An “interlock” is a device that operates to prevent the operation of machine while the cover or door of the machine is open or unlocked, and which will also hold the cover or door closed and locked while the machine is in motion.

**(16) Jig (dye).** A dye “jig” is a machine for dyeing piece goods. The cloth, at full width, passes from a roller through the dye liquor in an open vat and is then wound on another roller. The operation is repeated until the desired shade is obtained.

**(17) Kier.** A “kier” is a large metal vat, usually a pressure type, in which fabrics may be boiled out, bleached, etc.

**(18) Lapper (ribbon).** A ribbon “lapper” is a machine used to prepare laps for feeding a cotton comb; its purpose is to provide a uniform lap in which the fibers have been straightened as much as possible.

**(19) Lapper (sliver).** A sliver “lapper” is a machine in which a number of parallel card slivers are drafted slightly, laid side by side in a compact sheet, and wound into a cylindrical package.

**(20) Loom.** A “loom” is a machine for effecting the interlacing of two series of yarns crossing one another at right angles. The warp yarns are wound on a warp beam and pass through heddles and reed. The filling is shot across in a shuttle and settled in place by reed and lay, and the fabric is wound on a cloth beam.

**(21) Mangle (starch).** A “starch mangle” is a mangle that is used specifically for starching cotton goods. It commonly consists of two large rolls and a shallow open vat with several immersion rolls. The vat contains the starch solution.

**(22) Mangle (water).** A “water mangle” is a calender having two or more rolls used for squeezing water from fabrics before drying. Water mangles also may be used in other ways during the finishing of various fabrics.

**(23) Mule.** A “mule” is a type of spinning frame having a head stock and a carriage as its two main sections. The head stock is stationary. The carriage is movable and it carries the spindles which draft and spin the roving into the yarn. The carriage extends over the whole width of the machine and moves slowly toward and away from the head stock during the spinning operation.

**(24) Nip.** “Nip shall mean the point of contact between two in-running rolls.

**(25) Openers and pickers.** “Openers and pickers” means a general classification which includes breaker pickers, intermediate pickers, finisher pickers, single process pickers, multiple process pickers, willow machines, card and picker waste cleaners, thread extractors, shredding machines, roving waste openers, shoddy pickers, bale breakers, feeders vertical openers, lattice cleaners, horizontal cleaners, and any similar machinery equipped with either cylinders, screen section, calender section, rolls, or beaters used for the preparation of stock for further processing.

**(26) Paddler.** A “paddler” consists of a trough for a solution and two or more squeeze rolls between which cloth passes after being passed through a mordant or dye bath.

**(27) Point of operation.** “Point of operation” shall mean that part of the machine where the work of cutting, shearing, squeezing, drawing, or manipulating the stock in any other way is done.

**(28) Printing machine (roller type).** A “roller printing machine” is a machine consisting of a large central cylinder, or pressure bowl, around the lower part of the perimeter of which is placed a series of engraved color rollers (each having a color trough), a furnisher roller, doctor blades, etc. The machine is used for printing fabrics.

**(29) Ranges (bleaching continuous).** “Continuous bleaching ranges” are of several types and may be made for cloth in rope or open-width form. The goods, after wetting out, pass through a squeeze roll into a saturator containing a solution of caustic soda and then to an enclosed J-box. A v-shaped arrangement is attached to the front part of the J-box for uniform and rapid saturation of the cloth with steam before it is packed down in the J-box. The cloth, in a single strand rope form, passes over a guide roll down the first arm of the “V” and up the second. Steam is injected into the “V” at the upper end of the second arm so that the cloth is rapidly saturated with steam at this point. The J-box capacity is such that cloth will remain hot for a sufficient time to complete the scouring action. It then passes a series of washers with a squeeze roll in between. The cloth then passes through a second set of saturator, J-box, and washer, where it is treated with the peroxide solution. By slight modification of the form of the unit, the same process can be applied to open-width cloth.

**(30) Range (mercerizing).** A “mercerizing range” consists generally of a 3-bowl mangle, a tenter frame, and a number of boxes for washing and scouring. The whole setup is in a straight line and all parts operate continuously. The combination is used to saturate the cloth with sodium hydroxide, stretch it while saturated, and washing out most of the caustic before releasing tension.

**(31) Sanforizing machine.** A “sanforizing machine” is a machine consisting of a large steam-heated cylinder, an endless, thick woolen felt blanket which is in close contact with the cylinder for most of its perimeter, and an electrically heated shoe which presses the cloth against the blanket while the latter is in a stretched condition as it curves around feed-in roll.

**(32) Shearing machine.** A “shearing machine” is a machine used in shearing cloth. Cutting action is provided by a number of steel blades spirally mounted on a roller. The roller rotates in close contact with a fixed ledger blade. There may be from one to six such rollers on a machine.

**(33) Singeing machine.** A “singeing machine” is a machine used particularly with cotton; it comprises of a heated roller, plate, or an open gas flame. The material is rapidly passed over the roller or the plate or through the open gas flame to remove fuzz or hairiness on yarn or cloth by burning.

**(34) Slasher.** A “slasher” is a machine used for applying a size mixture to warp yarns. Essentially, it consists of a stand of holding section beams, a size box, one or more cylindrical dryers or an enclosed hot air dryer, and a beaming end for finding the yarn on the loom beams.

**(35) Solvent (industrial organic).** "Industrial organize solvent" means any organic volatile liquid or compound, or any combination of these substances which are used to dissolve or suspend a nonvolatile or slightly volatile substance for industrial utilization. It shall also apply to such substances when used as detergents or cleansing agents. It shall not apply to petroleum products when such products are used as fuel.

**(36) Tenter frame.** A "tenter frame" is a machine for drying cloth under tension. It essentially consists of a pair of endless traveling chains fitted with clips of fine pins and carried on tracks. The cloth is firmly held at the selvages by the two chains which diverge as they move forward so that the cloth is brought to the desired width.

**(37) Warper.** A "warper" is any machine for preparing and arranging the yarns intended for the warp of a fabric, specifically, a beam warper.

**(c) General safety requirements.**

**(1) Means of stopping machines.** Every textile machine shall be provided with individual mechanical or electrical means for stopping such machines. On machines driven by belts and shafting, a locking-type shifter or an equivalent positive device shall be used. On operations where injury to the operator might result if motors were to restart after power failures, provision shall be made to prevent machines from automatically restarting upon restoration of power.

**(2) Handles.** Stopping and starting handles shall be designed to the proper length to prevent the workers hand or fingers from striking against any revolving part, gear guard, or any other part of the machine.

**(3) Machine guarding.** Mechanical power-transmission equipment shall be guarded in conformity with the general industry standard Part 7, Guards for Power Transmission.

**(4) Housekeeping.** Aisles and working spaces shall be kept in good order, clean and free of obstructions in accordance with requirements of the department of consumer & industry services.

**(5) Inspection and maintenance.** All guards and other safety devices, including starting and stopping devices, shall be properly maintained.

**(6) Lighting.** Lighting shall conform to American National Standard A11.1-1965.

**(7) Identification of piping systems.** Identification of piping systems shall conform to American national Standard A13.1-1956.

**(8) Identification of physical hazards.** Identification of physical hazards shall be in accordance with the requirements of §1910.144.

**(9) Steam pipes.** All pipes carrying steam or hot water for process or servicing machinery, when exposed to contact and located within seven feet of the floor or working platform shall be covered with a heat-insulating material, or otherwise properly guarded.

**(d) Openers and pickers.**

**(1) Beater guards.** When any opening or picker machinery is equipped with a beater, such beater shall be provided with metal covers which will prevent contact with the beater. Such covers shall be provided with an interlock which will prevent the

cover from being raised while the machine is in motion and prevent the operation of the machine while the cover is open.

**(2) Cleanout holes.** Cleanout holes within reaching distance of the fan or picker beater shall have their covers securely fastened and they shall not be opened while the machine is in motion.

**(3) Feed rolls.** The feed rolls on all opening and picking machinery shall be covered with a guard designed to prevent the operator from reaching the nip while the machinery is in operation.

**(4) Removal of foreign ferrous material.** All textile opener lines shall be equipped with magnetic separators, tramp iron separators, or other means for the removal of foreign ferrous material.

**(e) Cotton cards.**

**(1) Enclosures.** Cylinder and lickerins shall be completely protected and the doffers should be enclosed.

**(2) Enclosure fastenings.** The enclosures or covers shall be kept in place while the machine is in operation, except when stripping or grinding.

**(3) Stripping rolls.** On operations calling for flat strippings which are allowed to fall on the doffer cover, where such strippings are removed by hand, the doffer cover shall be kept closed and securely fastened to prevent the opening of the cover while the machine is in operation. When it becomes necessary to clean the cards while they are in motion, a long-handled brush or dust mop shall be used.

**(f) Garnett machines.**

**(1) Lickerin.** Garnett lickerins shall be enclosed.

**(2) Fancy rolls.** Garnett fancy rolls shall be enclosed by covers. These shall be installed in a way that keeps worker rolls reasonably accessible for removal or adjustment.

**(3) Underside of machine.** The underside of the garnett shall be guarded by a screen mesh or other form of enclosure to prevent access.

**(g) Spinning mules.**

A substantial fender of metal or hardwood shall be installed in front of the carriage wheels, the fender to extend to within one-fourth inch of the rail.

**(h) Slashers.**

**(1) Cylinder dryers.**

**(i) Reducing valves, safety valves, and pressure gages.** Reducing valves, safety valves, and pressure gages shall conform to the ASME Pressure Vessel Code, Section VIII, Unfired Pressure Vessels, 1968.

**(ii) Vacuum relief valves.** Vacuum relief valves shall conform to the ASME Code for Pressure Vessels, Sections VIII, Unfired Pressure Vessels, 1968.

**(iii) Lever control.** When slashers are operated by control levers, these levers shall be connected to a horizontal bar or treadle located not more than 69 inches above the floor to control the operation from any point.

(iv) **Pushbutton control.** Slashers operated by pushbutton control shall have stop and start buttons located at each end of the machine, and additional buttons located on both sides of the machine, at the size box and the delivery end. If calender rolls are used, additional buttons shall be provided at both sides of the machine at point near the nips, except when slashers are equipped with an enclosed dryer.

(v) **Nip guards.** All nip guards shall comply with the requirements of subparagraph (2)(iv) of this paragraph.

(vi) **Cylinder enclosure.** When enclosures or hoods are used over cylinder drying rolls, such enclosures or hoods shall be provided with an exhaust system which will effectively prevent wet air and steam from escaping into the workroom.

(vii) **Expansion chambers.** Slasher kettles and cookers shall be provided with expansion chambers in the covers, or drains, to prevent surging over. Steam-control valves shall be so located that they can be operated without exposing the worker to moving parts, hot surfaces, or steam.

**(2) Enclosed hot air dryer.**

(i) **Lever control.** When slashers are operated by control levers, these levers shall be connected to a horizontal bar or treadle located not more than 69 inches above the floor to control the operation from any point.

(ii) **Push-button control.** Slashers operated by push-button control shall have one start button at each end of the machine and stop buttons shall be located on both sides of the machines at intervals spaced not more than 6 feet on centers. Inching buttons should be installed.

(iii) **Dryer enclosure.** The fryer enclosure shall be provided with an exhaust system which will effectively prevent wet air and steam from escaping into the workroom.

(iv) **Nip guards.** All nip guards shall comply with Table R-1.

**TABLE R-1  
Guard Openings**

Openings in the guard or between the guard and working surface shall not be greater than the following:

Distance of opening from nip point	Maximum width of opening
0 to 1 1/2 .....	1/4
1 1/2 to 2 1/2 .....	3/8
2 1/2 to 3 1/2 .....	1/2
3 1/2 to 5 1/2 .....	5/8
5 1/2 to 6 1/2 .....	3/4
6 1/2 to 7 1/2 .....	7/8
7 1/2 to 8 1/2 .....	1 1/4

The measurements in Table R-1 are all in inches.

(v) **Expansion chambers.** Slasher kettles and cookers shall be provided with expansion chambers in the covers, or drains, to prevent surging over. Steam control valves shall be so located that they can be operated without exposing the worker to moving parts, hot surfaces, or steam.

**(i) Warpers.**

(1) **Swiveled double-bar gates.** Swiveled double-bar gates shall be installed on all warpers operating in excess of 450 yards per minute. These gates shall be so interlocked that the machine cannot be operated until the gate is in the "closed position," except for the purpose of inching or jogging.

(2) **Closed position.** "Closed position" shall mean that the top bar of the gate shall be at least 42 inches from the floor or working platform; and the lower bar shall be at least 21 inches from the floor or working platform; and the gate shall be located 15 inches from the vertical tangent to the beam head.

**(j) Drawing frames, slubbers, roving parts, cotton combers, ring spinning frames, twisters.**

Gear housing covers on all installations of drawing frames, slubbers, roving frames, cotton combers, ring spinning frames, and twisters shall be equipped with interlocks.

**(k) Gill boxes.**

(1) **Pin guard.** A guard shall be placed ahead of the feed end and shall be so designed that it will prevent the worker's fingers from being caught in the pins of the intersecting fallers.

(2) **Nip guards.** All nip guards shall comply with the requirements of paragraph (h)(2)(iv) of this section.

**(l) Heavy draw boxes, finishers, and speeders used in worsted drawing.**

(1) **Band pulley covers.** Covers for band pulleys shall be closed when the machine is in motion.

(2) **Benches or working platforms.** Benches or working platforms approximately 10 inches in height and 8 inches in width should be installed along the entire running length of the machine for the worker to stand on while creeling the machine. Such benches or platforms shall be covered with an abrasive or nonslip material.

**(m) Sliver and ribbon lappers (cotton).**

Cover guard. An interlocking cover guard shall be installed over the large calender drums and the lap spool, designed to prevent the operator from coming in contact with the nip.

**(n) Looms.**

(1) **Shuttle guard.** Each loom shall be equipped with a guard designed to minimize the danger of the shuttle flying out of the shed.

(2) **Protection for loom fixer.** Provisions shall be made so that every loom fixer can prevent the loom from being started while he is at work on the loom. This may be accomplished by means of a lock, the key to which is retained in the possession of the loom fixer, or by some other effective means to prevent starting the loom.

**(o) Shearing machines.**

All revolving blades on shearing machines shall be guarded so that the opening between the cloth surface and the bottom of the guard will not exceed three-eighths inch.

**(p) Continuous bleach range (cotton and rayon).**

**(1) J-box protection.** Each valve controlling the flow of steam, injurious gases, or liquids into a J-box shall be equipped with a chain, lock, and key, so that any worker who enters the J-box can lock the valve and retain the key in his possession. Any Other method which will prevent steam, injurious gases, or liquids from entering the J-box while the worker is in it will be acceptable.

**(2) Open-width bleaching.** The nip of all in-running rolls on open-width bleaching machine rolls shall be protected with a guard to prevent the worker from being caught at the nip. The guard shall extend across the entire length of the nip.

**(q) Kiers.**

**(1) Reducing valves, safety valves and pressure gages.** Reducing valves, safety valves, and pressure gages shall conform to the ASME Code for Unfired Pressure Vessels, Section VIII, Unfires Pressure Vessels, 1968.

**(2) Kier valve protection.** Each valve controlling the flow of steam, injurious gases, or liquids into a kier shall be equipped with a chain, lock, and key, so that any worker who enters the kier can lock the valve and retain the key in his possession. Any other method which will prevent steam, injurious gases, or liquids from entering the kier while the worker is in it will be acceptable.

**(r) Gray and white bins.**

On new installations guard rails conforming to the general industry standard Part 2, Floor and Wall Openings, Stairways and Skylights shall be provided where workers are required to plait by hand from the top of the bin so as to protect the worker from falling to a lower level.

**(s) Mercerizing range (piece goods).**

**(1) Stopping devices.** A stopping device shall be provided at each end of the machine.

**(2) Frame ends.** A guard shall be installed at each end of the frame between the in-running chain and the clip opener, to prevent the worker's fingers from being caught.

**(3) Mangel and washers.** The nip at the in-running rolls shall conform to the general industry standard Part 71, Laundry and Dry Cleaning Machinery and Operations.

**(t) Tenter frames.**

**(1) Stopping devices.** A stopping device shall be provided at each end of the machine.

**(2) Frame ends.** A guard shall be installed at each end o the frame at the in-running chain and clip opener.

**(3) Oil cups.** Oil cups shall be safely located to permit easy access.

**(u) Dyeing jigs.**

**(1) Stopping devices.** Each dye jig shall be equipped with individual mechanical or electrical means for stopping the machine.

**(2) Roll arms.** Roll arms on jigs shall be build to allow for extra large batches, and to prevent the center bar from being forced off, causing the batch to fall.

**(v) Padders – nip guards.**

All nip guards shall comply with the requirements of paragraph (h)(2)(iv) of this section.

**(w) Drying cans.**

**(1) Pressure reducing valves and pressure gages.** Pressure reducing valves and pressure gages shall conform to the ASME Code for Pressure Vessels, Section VIII, 1968, Unfired Pressure Vessels.

**(2) Vacuum collapse.** If cans are not designed to prevent vacuum collapse, each can shall be equipped with one or more vacuum relief valves with openings of sufficient size to prevent the collapse of the can if vacuum occurs.

**(x) Flat-work ironer.**

**(1) Feed rolls.** The feed rolls shall be guarded to conform to the general industry standard Part 71, Laundry and Dry Cleaning Machinery and Operations.

**(2) Pressure rolls.** Pressure rolls shall be covered or guarded to conform to the general industry standard Part 71, Laundry and Dry Cleaning machinery and Operations.

**(y) Extractors.****(1) Centrifugal extractor.**

**(i) Cover.** Each extractor shall be equipped with a metal cover.

**(ii) Interlocking device.** Each extractor shall be equipped with an interlocking device that will prevent the cover from being opened while the basket is in motion, and also prevent the power operation of the basket while the cover is open.

**(iii) Brakes.** Each extractor shall be equipped with a mechanically or electrically operated brake to quickly stop the basket when the power driving the basket is shut off.

**(iv) Maximum allowable speed.** Each centrifugal extractor shall be effectively secured in position on the floor or foundation so as to eliminate unnecessary vibration, and should not be operated at a speed greater than the manufacturer's rating, which shall be stamped where easily visible in letters not less than one-quarter inch in height. The maximum allowable speed shall be given in revolutions per minute (rpm).

**(2) Engine drum extractor – overspeed governor.** Each engine individually driving an extractor shall be provided with an approved engine stop and speed limit governor.

**(3) Squeezer or wringer extractor nip guards.** All nip guards shall comply with the requirements of paragraph (h)(2)(iv) of this section.

**(z) Nip guards.**

All nip guards for water mangle, starch mangle, back-washer (worsted yarn) crabbing machines, decating machines, shall comply with the requirements of paragraph (h)(2)(iv).

**(aa) Sanforizing and palmer machine.**

A safety trip rod, cable, or wire center cord shall be provided across the front and back of all palmer cylinders extending the length of the face of the cylinder. It shall operate readily whether pushed or pulled. This safety trip shall be not more than 72 inches above the level on which the operator stands and shall be readily accessible.

**(bb) Rope washers.**

**(1) Splash guard.** Splash guards shall be installed on all rope washers unless the machine is so designed as to prevent the water or liquid from splashing the operator, the floor, or working surface.

**(2) Safety stop bar.** A safety trip rod, cable or wire center cord shall be provided across the front and back of all rope washers extending the length of the face of the washer. It shall operate readily whether pushed or pulled. This safety trip shall be not more than 72 inches above the level on which the operator stands and shall be readily accessible.

**(cc) Laundry washer tumbler or shaker.**

**(1) Interlocking device.** Each drying tumbler, each double cylinder shaker or clothes tumbler, and each washing machine shall be equipped with an interlock device which will prevent the power operation of the inside cylinder when the outer door on the case or shell is open, and which will also prevent the outer door on the case or shell from being opened without shutting off the power. This should not prevent the movement of the inner cylinder by means of a hand operated mechanism or an "inching device."

**(2) Means of holding covers or doors in open position.** Each enclosed barrel shall also be equipped with adequate means for holding open the doors or covers of the inner and outer cylinders or shells while it is being loaded or unloaded.

**(dd) Printing machine (roller type).**

**(1) Nip guards.** All nip guards shall comply with the requirements of paragraph (h)(2)(iv) of this section.

**(2) Crown wheel and roller gear nip protection.** The engraved roller gears and the large crown wheel shall be provided with the protective disc which will enclose the nips of the in-running gears. Individual discs for each nip will be acceptable.

**(ee) Calenders.**

The nip at the in-running side of the rolls shall be provided with a guard extending across the entire length of the nip and arranged to prevent the fingers of the workers from being pulled in between the rolls or between the guard and the rolls, and constructed so that the cloth can be fed into the rolls safely.

**(ff) Rotary staple cutters.**

A guard shall be installed completely enclosing the cutters to prevent the hands of the operator from reaching the cutting zone.

**(gg) Clothing folding machine.**

The crank arm and blade guide rods on both sides of the cloth-folding machines shall be protected from contact

by barrier guards constructed to conform to the requirements of the general industry standard Part 7, Guards for Power Transmission.

**(hh) Hand bailing machine.**

An angle-iron-handle stop guard shall be installed at the right angle to the frame of the machine. The stop guard shall be so designed and so located that it will prevent the handle from traveling beyond the vertical position should the handle slip from the operator's hand when the pawl has been released from the teeth of the takeup gear.

**(ii) Roll bench.**

Cleats shall be installed on the ends of roll benches.

**(jj) Cuttle or swing folder (overhead type).**

The bottom of the overhead folders shall be located not less than 7 feet from the floor or working surface.

**(kk) Color-mixing room.**

Floors in color-mixing rooms shall be constructed to drain easily.

**(ll) Open tanks and vats for mixing and storage of hot or corrosive liquids.**

**(1) Protection against falls.** Open tanks and vats containing hot or corrosive liquids shall be protected to conform to the requirements of the general industry standard Part 2, Floor and Wall Openings, Stairways and Skylights.

**(2) Shutoff valves.** Boiling tanks, caustic tanks and hot liquid containers, so located that the operator cannot see the contents from the floor or working area, shall have emergency shutoff valves controlled from a point not subject to danger of splash. Valves shall conform to the ASME Pressure Vessel Code, Section VIII, Unfired Pressure Vessels, 1968.

**(mm) Dye kettles and vats.**

Pipes or drains of sufficient capacity to carry the contents safely away from the working area shall be installed where there are dye kettles and vats which may at any time contain hot or corrosive liquids. These shall not empty directly onto the floor.

**(nn) Acid carboys.**

Carboys shall be provided with inclinators, or the acid shall be withdrawn from the carboys by means of pumping without pressure in the carboy, or by means of hand operated siphons.

**(oo) Handling caustic soda and caustic potash.**

Means shall be provided for handling and emptying caustic soda and caustic potash containers to prevent workers from coming in contact with the caustic (see paragraph (qq) of this section).

**(pp) First aid.**

Wherever acids or caustics are used, provisions shall be made for a copious and flowing supply of fresh, clean water.

**(qq) Personal protective equipment.**

**(1) Personal protective equipment.** Workers engaged in handling acids or caustics in bulk, repairing pipe lines containing acids or caustics, etc., shall be provided with protective occupational (safety) equipment to conform to the requirements of the general industry standards Part 33, Personal Protective Equipment; and the requirements of the department of consumer and industry services for respiratory protection.

**(2) Respirators, gas masks, and such appliances, for emergency use only, shall be of a type required by 1910.134.**

**(rr) Workroom ventilation.**

In all workrooms in which potentially toxic substances are used, the maximum allowable concentrations listed in 1910.1000 shall be maintained. Open surface tanks shall conform to the requirements of 1910.94(d).